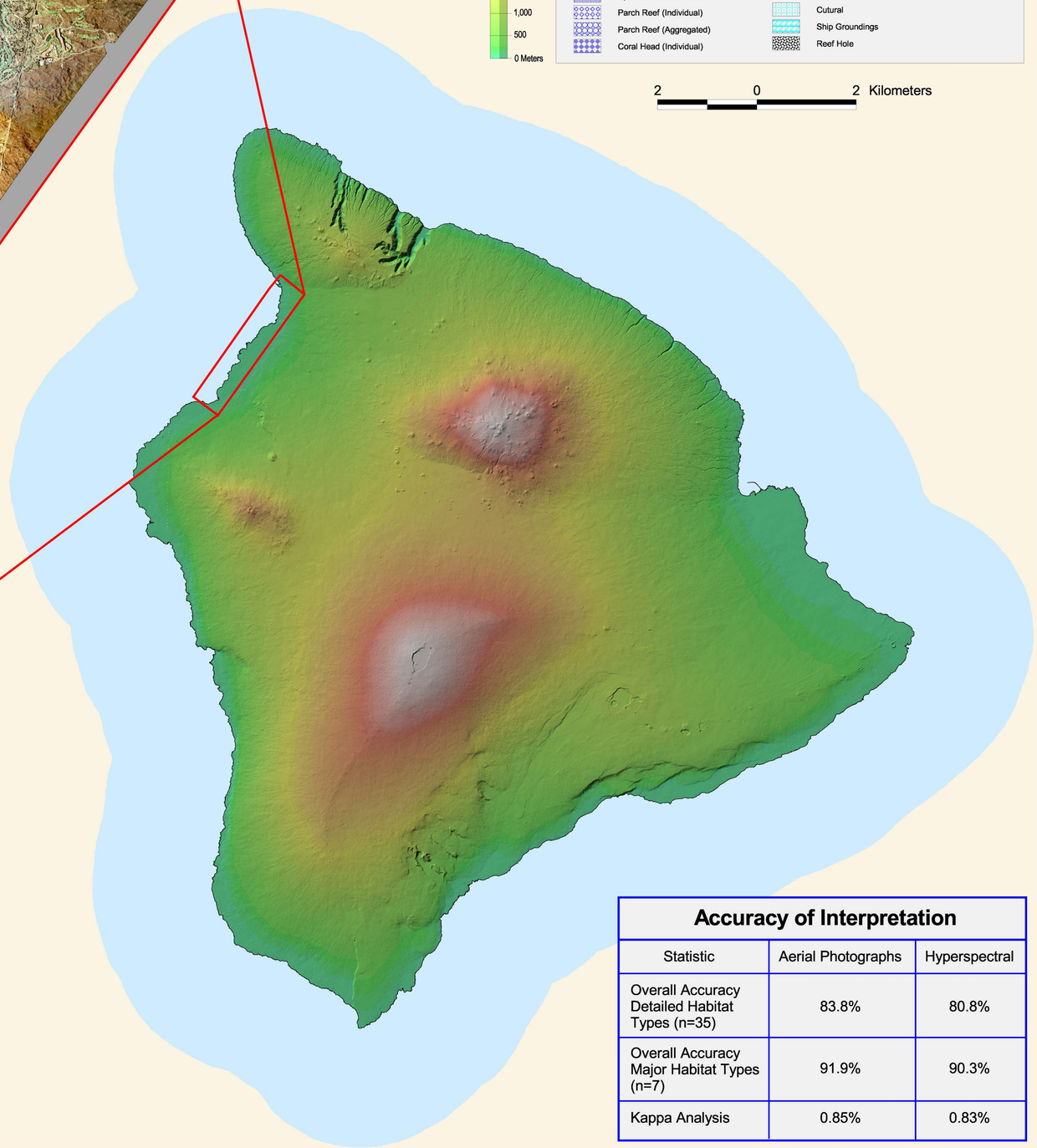
Mapping the Coral Reef Ecosystem

Products Derived for Kona, Hawai'i from NOAA Airborne Imagery

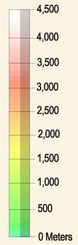
BENTHIC HABITAT MAPPING

NOAA's National Ocean Service (NOS) acquired color aerial photography and hyperspectral imagery (HSI) for the nearshore waters of the eight Main Hawaiian Islands. The images will be used to create maps of the region's marine resources including coral reefs and other important habitats for fisheries, tourism and aspects of the coastal economy. Accurate habitat maps are necessary for resource managers to make informed decisions about the protection and use of these areas.

A primary product of this effort is a benthic habitat map in geographic information system (GIS) format produced by interpreting the remotely collected image data. These benthic habitat maps have been produced by manual delineation of habitats from color aerial photographs and image analysis software applied to color and hyperspectral digital images. In both cases, benthic features have been classified using a hierarchical Coral Reef Habitat Classification Scheme. The scheme has been prepared from consultation, meetings and workshops that included the key coral reef biologists and mapping experts and professionals in the State of Hawaii.



Elevation Legend (Approximate)



Benthic Habitat Classification Scheme

Benthic Habitat Classification	
Sand	Coral Head (Aggregated)
Mud	Scattered Rock/Coral in Unconsolidated Sediments
Seagrass/Continuous	Colonized Pavement
Seagrass/10%-50%	Colonized Volcanic Rock/Boulder
Seagrass/50%-90%	Colonized pavement with Sand/Surge Channels
Macroalgae/Continuous	Uncolonized Pavement
Macroalgae/10%-50%	Reef Rubble
Macroalgae/50%-90%	Uncolonized Vertical Island Walls
Encrusting Coraline Algae (Cont)	Uncolonized Volcanic Rock/Boulders
Encrusting Coraline Algae(50%-90%)	Uncolonized Pavement with Sand/Surge Channels
Encrusting Coraline Algae(10%-50%)	Mangrove/Hau
Colonized Vertical Island Walls	Artificial
Linear Reef	Dredged
Spur and Groove Reef	Terriginous Rubble
Parch Reef (Individual)	Channel
Parch Reef (Aggregated)	Cutural
Coral Head (Individual)	Ship Groundings
	Reef Hole

2 0 2 Kilometers

Accuracy of Interpretation

Statistic	Aerial Photographs	Hyperspectral
Overall Accuracy Detailed Habitat Types (n=35)	83.8%	80.8%
Overall Accuracy Major Habitat Types (n=7)	91.9%	90.3%
Kappa Analysis	0.85%	0.83%

NOAA Center for Coastal Monitoring and Assessment

http://biogeo.nos.noaa.gov